

Clearance Record DOCUMENT COMMENT LOG

Originating Office: AIR-130	Document Description: AC 20-149B	Project Lead: Moin Abulhosn (Moin.Abulhosn@faa.gov)	Reviewing Office: GARMIN INTERNATIONAL (913-440-5019).	Date of Review: Dec 1, 2015.
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1	AC 20-149B	ALL	Throughout	There are several instances of the verb “must” used throughout this AC (e.g., 1.1, 6.1 Note, 8.2 Note 1 and Note 3, 12.2, 12.3, and 14.1).	<p>FAA Order 1320.46D, <i>FAA Advisory Circular System</i>, is applicable to “anyone who prepares and issues ACs” (ref. Chapter 1 paragraph 2). Order 1320.46D Chapter 3 paragraph 7.f states:</p> <p>“f. Use “must” to convey regulatory requirements. ... “Must” clearly conveys a requirement.”</p> <p>Every instance of the verb “must” within the entire draft AC should be examined to determine whether there is a clear regulatory requirement for the use of “must”.</p>	<p>If a clear regulatory requirement cannot be found when the verb “must” is used, the text should be revised to remove the implication that the guidance is based on a regulatory requirement.</p> <p>If a clear regulatory requirement can be found, it should be referenced to enable the reader to make the connection to the regulation that is the basis for the AC using the verb “must”.</p>	Conceptual	<p>Non Concur. The commenter quotes paragraph 7.f of the order out of context. The context of this paragraph is, “If you need to convey a regulatory requirement, use the word ‘must’, not the word ‘shall’.” These instructions do not restrict the FAA from using the word “must” in other ways in an AC, e.g. to indicate a required provision of following the AC <i>if</i> the AC is used as a means of compliance. That is, if an applicant elects to use the AC as the means of compliance, the applicant <i>must</i> follow that particular provision in order to follow the AC.</p> <p>In several instances, a regulatory reference <i>is</i> in fact applicable in relation to the use of “must”. In those instances, we have identified the regulatory reference in our comment disposition.</p> <p>No change needed to AC text.</p> <p>Discussed disposition with commenter.</p>

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2	AC 20-149B	1	1.1	<p>“However, if you use the means described in this AC, you must follow it in its entirety.”</p>	<p>The statement that “if you use the means described in this AC, you must follow it in its entirety” is contradictory to both the preceding statement in 1.1 that:</p> <p>“This AC describes an acceptable means, but not the only means, to gain airworthiness approval for your FIS-B avionics equipment.”</p> <p>And FAA Order 1320.46D, <i>FAA Advisory Circular System</i>, Chapter 3 paragraph 9.c, which states:</p> <p>“c. ACs may set forth acceptable ways of complying with a particular regulation. However, do not imply that the AC represents the only acceptable way to comply. A person is free to follow the AC or to meet the regulatory requirement in a different way.”</p> <p>It also should be acceptable to use only parts of the means described within this AC provided deviations are clearly identified. Additionally, as noted in a previous comment on use of the verb “must”, no regulatory basis has been identified for using “must” in this statement.</p>	<p>Revise this statement so that the statements in 1.1 are internally consistent and consistent with requirements of FAA Order 1320.46D. Or, simply remove this statement.</p>	Conceptual	<p>Non Concur. The FAA disagrees that the statement in question contradicts the preceding statement, or that it implies that the AC is the only acceptable way to comply. In fact, the preceding statement makes it clear that the applicant may elect to use means other than this AC to show compliance for FIS-B avionics equipment. The FAA agrees that it also continues to be acceptable to propose, and obtain FAA (or its authorized representatives) agreement for, deviations from specific provisions of the AC to show compliance using different methods. However, the FAA stresses that we (or our authorized representatives) must agree to the proposed means of compliance, including use of means other than the AC. If an applicant elects to use this AC as the means of compliance, and does not obtain FAA (or its authorized representatives’) agreement for deviations from specific provisions of the AC, the applicant must follow all provisions of the AC in order to show compliance.</p> <p>As stated in our response to the previous comment, Order 1320.46D does not restrict the FAA from using the word “must” in an AC for purposes other than conveying a regulatory requirement, but merely instructs the use of the word “must” rather than “shall” when conveying a regulatory requirement. We use the word “must” here to indicate that if you elect to use this AC as the means of compliance, and do not obtain agreement to deviate from specific provisions of this AC, you must follow all provisions of the AC in order to make an acceptable compliance showing.</p> <p>No change needed to AC text.</p> <p>Discussed disposition with commenter.</p>

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3	AC 20-165	5	6.1 Note	“Although Class 1 equipment is considered an FAA-approved source for these products, FIS-B information must not be used in place of a standard preflight briefing.”	As noted in a previous comment on use of the verb “must”, no regulatory basis has been identified for using “must” in this statement. Additionally, using “must” within a Note would not clearly identify a regulatory requirement if one exists.	If a clear regulatory requirement can be found, this statement should be moved out of the Note and the regulatory requirement should be referenced to enable the reader to make the connection. Otherwise, change “must” to “should”.	Conceptual	Non Concur. Regulatory reference is Sec. 91.103(a), Preflight Action. This operating rule requires the pilot in command, before beginning a flight, to become familiar with all available information concerning that flight, including weather reports and forecasts for a flight under IFR or a flight not in the vicinity of an airport. The FAA does not accept FIS-B information as adequate to meet the weather reports and forecasts requirements of that rule as a stand-alone source. No change needed to AC text. Discussed disposition with commenter.
4	AC 20-165	8	8.2 Note 1	“Although we consider Class 1 equipment uplink an FAA-approved source for these products, FIS-B Class 1 equipment uplink information must not be used in place of a standard preflight briefing.”	As noted in a previous comment on use of the verb “must”, no regulatory basis has been identified for using “must” in this statement. Additionally, using “must” within a Note would not clearly identify a regulatory requirement if one exists.	If a clear regulatory requirement can be found, this statement should be moved out of the Note and the regulatory requirement should be referenced to enable the reader to make the connection. Otherwise, change “must” to “should”.	Conceptual	Non Concur. Regulatory reference is Sec. 91.103(a), Preflight Action. This operating rule requires the pilot in command, before beginning a flight, to become familiar with all available information concerning that flight, including weather reports and forecasts for a flight under IFR or a flight not in the vicinity of an airport. The FAA does not accept FIS-B information as adequate to meet the weather reports and forecasts requirements of that rule as a stand-alone source. No change needed to AC text. Discussed disposition with commenter.
5	AC 20-165	8	8.2 Note 3	“To ensure safe operations, use of FIS-B must be as described in paragraph 8.1 above.”	As noted in a previous comment on use of the verb “must”, no regulatory basis has been identified for using “must” in this statement. Additionally, using “must” within a Note would not clearly identify a regulatory requirement if one exists.	If a clear regulatory requirement can be found, this statement should be moved out of the Note and the regulatory requirement should be referenced to enable the reader to make the connection. Otherwise, change “must” to “should”.	Conceptual	Non Concur. Use of the word “must” in this section indicates that the FAA considers it critical to safe flight for the flightcrew to use the equipment in accordance with its operating instructions, as specified in paragraph 8.1. If the crew does not follow the operating instructions, the minor hazard classification is invalidated. No change needed to AC text. Discussed disposition with commenter.

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6	AC 20-149B	10	12.2	<p>“If your FIS-B avionics equipment contains a rechargeable lithium battery, you must address the flammability risk. Rechargeable lithium batteries must meet airworthiness standards appropriate for the battery size and intended function such as TSO-C179a, <i>Permanently Installed Rechargeable Lithium Cells, Batteries and Battery Systems</i>, dated April 19, 2011.”</p>	<p>As noted in a previous comment on use of the verb “must”, no regulatory basis has been identified for using “must” in this statement.</p> <p>Additionally, FAA has now published AC 20-184, <i>Guidance on Testing and Installation of Rechargeable Lithium Battery and Battery Systems on Aircraft</i>. The AC 20-184 guidance should supersede what is stated in draft AC 20-149B.</p>	<p>Change to:</p> <p>“If your FIS-B avionics equipment contains a rechargeable lithium battery, AC 20-184, <i>Guidance on Testing and Installation of Rechargeable Lithium Battery and Battery Systems on Aircraft</i>, dated October 15, 2015, provides manufacturers and installers with an acceptable means of compliance to meet the installation, operation, maintenance and airworthiness requirements for installation of lithium batteries on aircraft.”</p>	Conceptual	Partial concurrence. This AC does not contradict the recently published AC 20-184. Therefore, the statement “AC 20-184, <i>Guidance on Testing and Installation of Rechargeable Lithium Battery and Battery Systems on Aircraft</i> , dated October 15, 2015.” will be added to this paragraph. Reference to “such as TSO-C179a” will be maintained.

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7	AC 20-149B	10	12.3	<p>“If your FIS-B avionics equipment includes an additional external antenna(s) and the aircraft has approval for flight in known icing conditions, the antenna must not accumulate harmful amounts of ice that may go into an engine, degrade aerodynamic performance, or adversely affect the structural integrity of the aircraft. Refer to the applicable AC on ice protection (AC 23.1419-2D, Change 1; AC 25-28; AC 27.1419 in master AC 27-1B, Changes 1-5; or AC 29.1419 in master AC 29-2C, Changes 1-5).”</p>	<p>As noted in a previous comment on use of the verb “must”, no regulatory basis has been identified for using “must” in this statement.</p> <p>Additionally, the referenced ACs are associated with regulations on ice protection equipment, not antennas associated with other equipment like FIS-B.</p>	<p>If a clear regulatory requirement cannot be found, the text should be revised to remove the implication that the guidance is based on a regulatory requirement.</p> <p>If a clear regulatory requirement can be found, it should be referenced to enable the reader to make the connection to the regulation that is the basis for the AC using the verb “must”.</p>	Conceptual	<p>Partially Concur. Regulatory reference is Sec. 23/25/27/29.1419, Ice protection. The provisions in this section of the AC are intended to ensure that the FIS-B antenna installation does not invalidate the aircraft’s approval for flight in known icing conditions. The XX.1419 ACs (and AC 25-28) cited in this section provide an acceptable means of compliance to the XX.1419 requirements, including for components such as antennas. To better align this guidance with the regulatory requirements for flight in known icing conditions, we will change this paragraph to read:</p> <p>“If your FIS-B avionics equipment includes an additional external antenna(s) and the aircraft has approval for flight in known icing conditions, you must evaluate the FIS-B antenna installation to ensure that the installation does not adversely affect the aircraft’s icing approval. Specific concerns to be evaluated include accumulation of harmful amounts of ice that may excessively degrade aerodynamic performance, stability, or controllability; or ice shedding that may go into an engine or propeller or create hazards to the structural integrity of the aircraft. The applicable ACs on certification of aircraft for flight in icing conditions (AC 23.1419-2D, Change 1; AC 25-28; AC 27.1419 in master AC 27-1B, Changes 1-5; or AC 29.1419 in master AC 29-2C, Changes 1-5) provide an acceptable means of performing this evaluation.”</p>

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8	AC 20-149B	11-12	14.1 & 14.2	<p>“Provide an A/RFM or A/RFM supplement (A/RFMS), as applicable, with operating procedures for the FIS-B system. The A/RFM(S) Normal Operating Procedures section must include the following statements:</p> <p>...</p> <p>You may meet the requirement of this paragraph by attaching the equipment operating manual to the A/RFM(S), as long as the manual contains the above statements.”</p>	<p>As noted in a previous comment on use of the verb “must”, no regulatory basis has been identified for using “must” in this statement. There is no operating rule that requires FIS-B equipment or that would require A/RFM(S) content such as is suggested. It also would be inappropriate to cite a regulation such as 23.1583, “Operating Limitations”, and 23.1585, “Operating Procedures” since these regulations are intended for AFM(S) content for systems and equipment as it relates to the airworthiness of the aircraft and not the use of systems and equipment required to comply with an operating regulation. Consequently, unless a clear regulatory reference can be cited, an A/RFM(S) modification should not be required as is implied by the use of the verb “must”. Furthermore, the AC 20-149B guidance regarding A/RFM(S) content is inconsistent with FAA AC 25.1581-1, <i>Airplane Flight Manual</i>, paragraph 4.a, which states: (emphasis added; underline in original)</p> <p>And paragraph 5.c, which includes:</p>	<p>Suggest the following for 14 and its subparagraphs:</p> <ul style="list-style-type: none"> • Change the title of paragraph 14 to “Recommended Pilot’s Guide Content”, • Remove all references to AFM(S)/RFM(S), and • Change all instances of the verb “must” to “should” 	Conceptual	<p>Non Concur. Regulatory reference is Sec, 23/27/29.1301(a)(b)(c) and 25.1301(a)(1)(2)(3), Function and Installation, and Sec. 23/25/27/29.1581(a)(2), General [Operating Limitations and Information]. Sections 23/27/29.1301(a)(b)(c) and 25.1301(a)(1)(2)(3) require each item of installed equipment to:</p> <p>(a) Be of a kind and design appropriate to its intended function;</p> <p>(b) Be labeled as to its identification, function, or operating limitations, or any applicable combination of these factors; and</p> <p>(c) Be installed according to limitations specified for that equipment. Section XX.1581(a)(2) states that the A/RFM(S) required to be furnished with each aircraft must contain “Other information that is necessary for safe operation because of design, operating, or handling characteristics”. Accident history has shown that use of FIS-B weather information to attempt to maneuver the aircraft at minimum safe distances from hazardous weather is beyond the technical capability of the FIS-B system, and contrary to its intended function. The required manual language specified in this paragraph incorporates NTSB accident investigation findings regarding FIS-B capabilities, and is intended to ensure that specific information on technical limitations and proper operational use of the FIS-B equipment, which is essential to its safe use, is provided to operators with the equipment. No change needed to AC text.</p> <p>Discussed disposition with commenter.</p>

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					<p>“a. Airplane Flight Manual (AFM). An FAA-approved document that contains information (operating limitations, operating procedures, performance information, etc.) necessary to operate the airplane at the level of safety established by the airplane’s certification basis.”</p> <p>“c. The AFM content should be limited to the smallest practicable amount of material that is appropriate for the intended operation of the airplane. In general, the systems descriptions and procedures provided in the AFM for most large transport airplanes (i.e., those used in air carrier operations for which separate operating manuals are provided) should be limited to that which is uniquely related to airplane safety or airworthiness. ...” (emphasis added; underline in original)</p> <p>Similarly, the AC 20-149B guidance regarding A/RFM(S) content is inconsistent with FAA AC 23-8C, <i>Flight Test Guide for Certification of Part 23 Airplanes</i>, Appendix 5, <i>Guide for Preparing Airplane Flight Manual and Pilots’s Operating Handbook</i></p>			